CONFERENCE ON DISARMAMENT

CD/1163
7 August 1992

Original: ENGLISH

PROGRESS REPORT TO THE CONFERENCE ON DISARMAMENT ON THE THIRTY-FOURTH SESSION OF THE AD HOC GROUP OF SCIENTIFIC EXPERTS TO CONSIDER INTERNATIONAL COOPERATIVE MEASURES TO DETECT AND IDENTIFY SEISMIC EVENTS

1. The Ad Hoc Group of Scientific Experts to Consider International Cooperative Measures to Detect and Identify Seismic Events, initially established in pursuance of the decision taken by the Conference of the Committee on Disarmament on 22 July 1976, held its thirty-fourth formal session from 27 July to 7 August 1992, in the Palais des Nations, Geneva, under the Chairmanship of Dr. Ola Dahlman of Sweden. This was the twenty-sixth session of the Group, convened under its new mandate by the decision of the Committee on Disarmament at its 48th meeting on 7 August 1979.

2. The Ad Hoc Group is open to all member States of the Conference on Disarmament. It is also open on a standing basis to all non-member States which have been invited upon their request by the Conference on Disarmament to participate in its work. Accordingly, scientific experts and representatives of the following member States of the Conference on Disarmament participated in the session: Australia, Canada, China, Czech and Slovak Federal Republic, Egypt, France, Germany, Hungary, India, Indonesia, Iran (Islamic Republic of), Italy, Japan, Netherlands, Pakistan, Peru, Romania, Russian Federation, Sweden, United Kingdom of Great Britain and Northern Ireland and the United States of America.

3. Scientific experts and representatives from the following non-member States of the Conference on Disarmament participated in the session: Austria, Finland, New Zealand, Norway, Spain and Switzerland.

4. During the session, 38 papers containing information on national investigations related to the work of the Group were presented by experts from: Australia, Austria, Czech and Slovak Federal Republic, Finland, Germany, Hungary, Indonesia, Italy, Japan, New Zealand, Norway, Peru, Romania, Russian Federation, Sweden, United Kingdom of Great Britain and Northern Ireland and United States of America.

GE.92-62569/0331K

5. During its previous session, the Ad Hoc Group completed a technical evaluation of its Second Technical Test (GSETT-2). The results are contained in its sixth main report, submitted to the Conference on Disarmament as document CD/1144. During the present session, the Group completed five appendices to the sixth report, containing detailed technical material.

6. The Group continued its discussions on the seismological evaluation of the GSETT-2 and reviewed national investigations relevant in this regard. Subsequently the Group discussed a draft outline of the evaluation report and agreed on focusing this report on the detection and location capabilities achieved during GSETT-2. The Group envisages a report on this evaluation during its next session.

7. The Ad Hoc Group conducted in-depth discussions on the reassessment of the concept of a global system for the exchange of seismic data worked out in its Fifth Report (CD/903), based on the results and experiences gained from GSETT-2 and on recent scientific and technological developments. The discussions were focused on the overall design of the system and provided a basis for the direction of the Group's future work.

8. The Group noted that many of the results and experiences obtained in GSETT-2 will be important in reassessing the system concept and its various components. Some of the conclusions the Group drew from GSETT-2 will have a significant influence on the overall design of the system, e.g.:

- the need to take into account information from local and regional seismic networks;

- the future use of only one IDC (International Data Centre) in the global system;

- the need for improved analysis procedures, with emphasis on automation especially for event definition, location and depth estimation;

- the need for a network with adequate global coverage of high-quality stations, especially arrays.

9. The Group noted that many countries had undertaken bilateral cooperation in upgrading data acquisition, communication and data exchange systems during the GSETT-2. The Group encourages this cooperation to continue as it would contribute significantly to the future improvement of the system.

10. Over the last decade, scientific and technological developments have been significant not only in seismology, but also in information technology, an area of great importance for global seismological monitoring systems. The Group firmly believes that the design of the global system should fully utilize recent developments in science and technology. The Group identified the following areas as being important for the overall system concept:

- the rapid developments in global telecommunications;

- the general availability of high performance computers and methods and procedures for data management and analysis;

- the developments in regional seismology, i.e., based on seismological observations at distances less than 2,000 km.;

- the issues of redundancy, data authenticity, reliability and security.

The Ad Hoc Group envisages continuing the discussion of its future work, including the incorporation of new technologies, at its next session.

11. As to the overall conceptual design, the Group agreed on a tentative framework for studying design options, thus providing guidance to the more detailed work on the individual components of the system. This overall design concept might be revised in the light of results obtained from analysis of individual components.

This overall framework includes, inter alia:

- There should be only one IDC, which would operate on the basis of:

  (i) providing high quality data for national verification needs;

  (ii) increased automation in the analysis and operational procedures;

  (iii) improved quality control in all aspects of the system;

  (iv) improved procedures for waveform analysis;

  (v) the possibility of accepting and processing continuous digital data, provided that the seismological value of this can be demonstrated.

- The system would be composed of a global network of arrays and single stations, complemented by national regional networks consisting of stations intended primarily for surveillance of national and regional seismicity.

- The global network would consist of high quality stations and arrays. Such a network could be modelled by starting with the best stations in operation during GSETT-2, and extending these geographically to give uniform coverage. This network could then be extended or reduced in size to demonstrate several networks of varying sensitivity. Station types might be site-dependent. They should be open stations. Network studies should be based on revised event definition criteria to be proposed by the "Procedures" working group. Standards for station operation should be high.

- For the national regional networks, NDCs should be encouraged to report as accurately as possible on seismic events occurring within their territories. NDCs should be responsive to requests for data from their national networks.

In addition to the items listed above, the Group will endeavour to estimate the detection and identification capability of such global systems (see CCD/PV.713 of 22 July 1976 and CD/PV.48 of 7 August 1979).

12. The Ad Hoc Group established nine working groups of participating experts to elaborate on the following topics relevant to the design of the global system:

- Overall concepts
- Station design
- Site selection
- Network studies
- Seismological procedures
- Establishment of a single International Data Center
- Communications
- Interaction by the IDC with national regional networks
- Cost estimates

13. The Ad Hoc Group noted with appreciation the convening of an informal technical workshop by Australia in Canberra from 27 April to 1 May 1992 to evaluate the results of GSETT-2. Many participants of the Group were able to attend and contribute to the workshop. This aided in the Group's continued work on this subject.

14. The Ad Hoc Group has expressed the view that it might be useful, on a scientific and technical level, to share with the International Atomic Energy Authority (IAEA) the GSE technical concepts for the global exchange of seismic data in order to determine if the IAEA has particular technologies or experiences that might be useful to the Group in its work. To this end, the Ad Hoc Group suggests that, without any financial implications to the Conference, the IAEA be invited to send an observer to attend the Ad Hoc Group's next session.

15. The Ad Hoc Group suggests that its next session, subject to approval by the Conference on Disarmament, should be convened from 15 to 26 February 1993.

UN

CONFERENCE ON DISARMAMENT

CD/1163/Corr.1
13 August 1992

Original: ENGLISH

PROGRESS REPORT TO THE CONFERENCE ON DISARMAMENT ON THE THIRTY-FOURTH SESSION OF THE AD HOC GROUP OF SCIENTIFIC EXPERTS TO CONSIDER INTERNATIONAL COOPERATIVE MEASURES TO DETECT AND IDENTIFY SEISMIC EVENTS

Corrigendum

Page 4, paragraph 14, line 3:

correct "Authority" to read "Agency".

GE.92-62622

CONFERENCE ON DISARMAMENT

CD/1164
7 August 1992

Original: ENGLISH

STATEMENT MADE ON BEHALF OF THE "AUSTRALIA GROUP"
BY THE REPRESENTATIVE OF AUSTRALIA, AMBASSADOR PAUL O'SULLIVAN,
AT THE 629TH PLENARY MEETING OF THE CONFERENCE ON DISARMAMENT

I wish to refer in particular to the activities of the Australia Group. These are informal consultations on harmonising export control policies which were initiated in the absence of any global agreement on this subject. This issue has come up in the discussion about Article XI of the Chemical Weapons Convention. In order to help address some of the concerns that have been raised in that discussion I am authorised to make the following statement:

"The following States: Australia, Austria, Belgium, Canada, Denmark, Finland, France, Germany, Greece, Ireland, Italy, Japan, Luxemburg, Netherlands, New Zealand, Norway, Portugal, Spain, Sweden, Switzerland, the United Kingdom of Great Britain and Northern Ireland and the United States of America, members of the 'Australia Group', welcome the forthcoming signing of the Convention on the Prohibition of Chemical Weapons.

"This Convention, the first multilateral disarmament agreement of a universal character to include an international verification regime, offers a unique opportunity to eliminate a whole class of inhumane and abhorrent weapons.

"The strengthening of world security which will derive from the effective implementation of this Convention should be accompanied by increased co-operation among States. This is the objective of Article XI of the Convention, which the abovementioned States undertake fully to comply with.

"This Article aims at facilitating the fullest possible exchanges in the field of chemical activities for purposes not prohibited under the Convention so as to promote the harmonious economic or technological development of all States Parties.

"The abovementioned States are particularly aware of the need to preserve the proper balance between, on the one hand, the imperatives of the economic and technological development of States, especially in the chemical field, and, on the other hand, the security constraints placed upon them.

"The use which can be made of certain chemical products and equipment for purposes prohibited under the Convention should cause States which are future parties to the Convention to exercise the greatest vigilance so that the desire to ensure the greatest chance of development to all does not as a consequence facilitate, for certain proliferators, prohibited activities which constitute a potential threat to global security.

"The abovementioned States consider that the Convention on the Prohibition of Chemical Weapons, of which they undertake to be original signatories, will be a most valuable instrument to reach this goal.

"They undertake to review, in the light of the implementation of the Convention, the measures that they take to prevent the spread of chemical substances and equipment for purposes contrary to the objectives of the Convention, with the aim of removing such measures for the benefit of States Parties to the Convention acting in full compliance with their obligations under the Convention.

"They intend thus to contribute actively to an increase in commercial and technological exchanges between States and to the universal and full implementation of the Convention on the Prohibition of Chemical Weapons."

CONFERENCE ON DISARMAMENT

CD/1165
12 August 1992

Original: ENGLISH

REPORT OF THE AD HOC COMMITTEE ON PREVENTION OF AN ARMS RACE IN OUTER SPACE

I. INTRODUCTION

1. At its 612th plenary meeting on 13 February 1992, the Conference on Disarmament adopted the following decision (CD/1125):

> In the exercise of its responsibilities as the multilateral disarmament negotiating forum in accordance with paragraph 120 of the Final Document of the first special session of the General Assembly devoted to disarmament, the Conference on Disarmament decides to re-establish an Ad Hoc Committee under item 5 of its agenda entitled "Prevention of an Arms Race in Outer Space".
>
> The Conference requests the Ad Hoc Committee, in discharging that responsibility, to continue to examine, and to identify, through substantive and general consideration, issues relevant to the prevention of an arms race in outer space.
>
> The Ad Hoc Committee, in carrying out this work, will take into account all existing agreements, existing proposals and future initiatives as well as developments which have taken place since the establishment of the Ad Hoc Committee, in 1985, and report on the progress of its work to the Conference on Disarmament before the end of its 1992 session.

2. In that connection, some delegations made statements regarding the scope of the mandate.

II. ORGANIZATION OF WORK AND DOCUMENTS

3. At its 613th plenary meeting on 20th February 1992, the Conference on Disarmament appointed Ambassador Romulus Neagu of Romania as Chairman of the Ad Hoc Committee. Mr. Vladimir Bogomolov, Political Affairs Officer, United Nations Office for Disarmament Affairs served as the Committee's Secretary.

GE.92-62596

4. The Ad Hoc Committee held 13 meetings between 10th March and 11 August 1992.

5. In addition to the documents of the previous sessions [1/] the Ad Hoc Committee had before it the following documents relating to the agenda item submitted to the Conference on Disarmament during the 1992 session:

CD/1142 Letter dated 11 March 1992 from the Permanent Representative of Canada addressed to the Secretary-General of the Conference on Disarmament transmitting Compendia on Outer Space comprising Plenary Statements and Working Papers from 1991 Session of the Conference on Disarmament.

CD/OS/WP.52 Programme of Work

CD/OS/WP.53 Letter dated 15 May 1992 from the Friend of the Chairman of the Ad Hoc Committee on the Prevention of an Arms Race in Outer Space addressed to the Chairman of the Ad Hoc Committee on the Prevention of an Arms Race in Outer Space, forwarding the Working Paper "Table of Statements and Proposals by the members of the Conference on Disarmament relating to Confidence-Building Measures (CBMs) in Outer Space Activities".

CD/OS/WP.54 Working Paper entitled "Confidence-Building Measures in Space Activities", submitted by the Friend of the Chair, Col. G. Diachenko of the Delegation of the Russian Federation.

CD/OS/WP.55 Working Paper entitled "Nuclear Power Systems in Space", submitted by Mr Luciano Anselmo, Expert of the Delegation of Italy.

CD/OS/WP.56 Working Paper entitled "Remarks on keep-out zones in a code of conduct regime for outer space", submitted by Dr Hubert Feigl, Expert of the Delegation of Germany.

III. SUBSTANTIVE WORK DURING THE 1992 SESSION

6. Following consultations on the organization of work, at its first meeting on 10th March 1992, the Ad Hoc Committee adopted the following Programme of Work for the 1992 Session:

"1. Examination and identification of issues relevant to the prevention of an arms race in outer space;

1/ The List of Documents of the previous Sessions may be found in the 1985, 1986, 1987, 1988, 1989, 1990 and 1991 Reports of the Ad Hoc Committee, and in the special report to the Third Special Session of the General Assembly devoted to Disarmament (CD/642, CD/732, CD/787, CD/870, CD/834, CD/956, CD/1039 and CD/1111, respectively).

"2. Existing agreements relevant to the prevention of an arms race in outer space;

"3. Existing proposals and future initiatives on the prevention of an arms race in outer space;

"In carrying out its work with a view to finding and building upon areas of convergence, the Ad Hoc Committee will take into account relevant proposals, initiatives and developments since the establishment of the Committee in 1985 including those presented at the 1991 session of the Conference on Disarmament aimed at enhancing the work of the Ad Hoc Committee as reflected in the work of the Friends of the Chairman, who dealt with the following specific issues in open-ended consultations: Terminological Aspects related to the prevention of an arms race in outer space, issues related to Verification of ASATs and Confidence Building Measures, including improvement of existing and future data bases relating to space activities."

7. With regard to the organization of work, the Ad Hoc Committee agreed that it would give equal treatment to the subjects covered by its mandate and specified in its Programme of Work. Accordingly, the Committee agreed to allocate the same number of meetings to each of those subjects. It was noted that any member wishing to do so may discuss any subject important and relevant to the work of the Committee.

8. The work of the Ad Hoc Committee was governed by the mandate which aims at the Prevention of an Arms Race in Outer Space.

9. The Ad Hoc Committee agreed to continue to enjoy the assistance of the Friends of the Chairman who were appointed by the Chairman to deal with the following issues without prejudice to positions of delegations in open-ended consultations: a) terminological aspects, related to prevention of an arms race in outer space (The Hon. Anthony Monckton, Delegation of the United Kingdom of Great Britain and Northern Ireland); b) issues related to verification of ASATs (antisatellite weapons) (Dr. M. Karem, Delegation of Egypt); c) confidence-building measures in space activities (Col. G. Diachenko, Delegation of the Russian Federation).

10. The Committee benefitted from the scientific and technical contributions of experts from various delegations, who addressed specific issues and initiatives under consideration in the Committee. The subjects addressed

included technical, legal and terminological issues, i.e. peaceful and military uses, protection of satellites, keep-out zones, radioactive materials in outer space and principles governing the re-entry of nuclear power sources in the atmosphere, a need to build a set of principles of CBMs.

A. Examination and identification of issues relevant to the prevention of an arms race in outer space

11. Many delegations considered that, in the post Cold-war period, preventing an arms race in outer space was one of the principal tasks facing the Conference on Disarmament. In this age of high technology and qualitative increases in weapons precision, outer space stood out as an environment vulnerable to militarization. Some delegations stressed that action by the Conference on Disarmament in preventing an arms race in outer space was not only timely, but essential for ensuring that the province of all mankind was indeed explored and used exclusively for peaceful purposes. For those delegations weaponization of outer space was a potential hazard to the space activities of mankind and the peaceful use of outer space. In their view it would be too late to set about drafting a treaty on the prohibition of the weaponization of outer space once such weaponization became a fait accompli.

12. Many delegations expressed their regret that the mandate of the Committee remained the same, and that no substantive change had been added to its programme of work. Some delegations pointed out that the ad hoc Committee should as early as possible conduct substantive negotiations on the conclusion of a comprehensive legal instrument on the prevention of an arms race in outer space.

13. The Group of 21 considered that there was an urgent need to address this important agenda item so as to achieve progress. For this reason, the Group took a flexible position on the question of the mandate and the programme of work although it would have preferred the Committee to work under a negotiating mandate, which would help to concentrate the efforts of the Committee on concrete proposals.

14. In the view of several delegations the most promising directions of work of the Committee appeared to be in the area of CBMs: the development of a code of conduct/rules of the road, the establishment of "keep-out zones", the legal protection of satellites, an agreement on their immunity, the creation of an international trajectography centre, and of a satellite image processing agency.

15. One delegation of the Western Group addressing the subject of space debris indicated that various misconceptions about them had caused some to conclude that an international legal regime on space debris would be needed. In the view of this delegation for such a regime to be established, several legal issues, including the definition of space debris, jurisdiction and control over space debris, and the treatment of liability for damage from orbital debris would be only some of the many legal issues that would need to be resolved. Another delegation of the Western Group presented an expert who gave his own views on the legal background to some terminological issues. The expert referred to other international treaties and concluded that in his view, even though in some contexts "peaceful" meant "non-military", any ambiguity had been clarified by State practice which had not been contradicted in a forceful manner by any state formally protesting military utilisation of space. The expert believed that current military uses of space such as communications, navigation, photo reconnaissance, early warning and weather monitoring all appeared to be lawful.

16. Some delegations referred to the issue of the "Global Protection Against Limited Strikes" (GPALS). One delegation not belonging to any group indicated that although the world had undergone major changes, the research and development of space weapons had not come to an end. The new anti-ballistic missile system was not totally defensive in nature and also had an attacking capability. In its view the development of such a system would inevitably give rise to mutual suspicion among the states and contribute to more tensions in the world. It could also provoke countries with the ability to develop a ballistic missile system to speed up its development. In the opinion of that delegation the implementation of GPALS would surely violate the ABM Treaty, which would have to be either terminated or amended.

B. Existing agreements relevant to the prevention of an arms race in outer space

17. A majority of the members of the Committee pointed out that the legal regime applicable to outer space by itself did not guarantee the prevention of an arms race in outer space. There was a need to consolidate and reinforce that regime and enhance its effectiveness. Existing legal instruments were not satisfactory. Limited in scope, they were utterly inadequate in forestalling an arms race in outer space in that they contained no clear-out provisions on the prohibition of deployment of various types of space weapons,

except that of nuclear weapons and other weapons of mass-destruction. According to some delegations it was therefore necessary to conclude a legal instrument, acceptable to all states, on the de-weaponization of outer space, and on the prohibition of all types of space weaponry.

18. Some delegations of the Western Group maintained that the existing legal regime provided an equitable and balanced response to the need to promote peaceful uses and arms control in outer space.

19. One delegation of the Western Group stated that the legal regime governing outer space could be seen to be wide-ranging and logical. According to that delegation there were no contradictions in its framework, nor was the existing regime full of gaps and holes. It was effective, practical and, most of all, workable. It was not perfect, but its problems would be inherent in any legal regime for arms control in outer space. Any perceived gaps in the legal regime could be satisfied by particular attention to the principles now in existence. Other delegations of the same Group emphasized that what was really in question was compliance with the existing legal regime. They underlined that there were many nations that have not ratified or acceded to the existing international agreements pertaining to outer space and, for this reason, cooperative efforts could not be pursued on this subject in an effective manner.

20. Another delegation of the same group argued that the legal regime could be reinforced by improving state practice under existing conventions. For example, with respect to the Registration Convention, the United Nations Secretariat might devise some standard form of automatic despatch of notices to remind States of their obligations under the Convention. This would strengthen the role of the Secretary-General in the pursuit of greater transparency in outer space activities. The Conference on Disarmament might also recommend to the Security Council that it adopt a resolution both requesting the Secretary-General to send out automatic reminder notices, and setting up a committee of the Council to review periodically any failures of States to register their launches. The delegation suggested that more frequent use of Article IX of the Outer Space Treaty of 1967, might well serve as a consultative mechanism to expand the kind and amount of information to be provided under the Registration Convention. Article XI of the Outer Space Treaty could serve as a basis for requiring data beyond that which is currently routinely provided under the Registration Convention. It would also underline the more active role which the Secretary-General might play and indeed seemed already authorized to play in serving a data-collection function.

C. Existing proposals and future initiatives on the prevention of an arms race in outer space

21. The Group of 21 recalled its proposal for the ad-hoc Committee to have a negotiating mandate. The Group held the position that the Committee should focus on concrete proposals for measures with a view to conducting negotiations for the conclusion of an agreement or agreements, as appropriate, to prevent an arms race in outer space in all its aspects.

22. Some delegations reiterated that the Outer Space Treaty, in the first paragraph of Article IV, left a legal loophole exploited by some space powers to develop a new generation of weapons that could be placed in outer space. In this connection, one delegation recalled its proposal contained in document CD/851 to amend Article IV. It stressed that the proposal was aimed at filling in an important juridical vacuum in the Outer Space Treaty and to prevent the stationing in outer space of weapons other than nuclear and mass destruction weapons.

23. The question of the functioning of the Registration Convention and ways of strengthening the regime established by it, was again addressed by several delegations. Improvements could include the provision of more timely and specific information concerning the function of satellites, including whether the satellite was fulfilling a civilian or military mission.

24. In connection with the legal protection of satellites, some delegations indicated that both the questions of ASAT weapons and of immunity of space devices should be addressed in order to achieve an ASAT prohibition and to guarantee legal immunity for satellites performing definitive peaceful functions. One delegation of the Western Group recalled that it had not found any measure in the field of ASATs that would be verifiable or equitable. The inability to construct a suitable and effective verification system could prevent agreements from being finalized. On the subject of "keep-out zones", it had concluded that the physical characteristics of space and spacecraft motion, coupled with the sheer number of objects that would need to be tracked, would make it difficult, if not impossible, for most space nations to monitor compliance with "keep-out zones". In its view keep-out zones would not be practical for providing protection to satellites. Another delegation indicated that verification and monitoring of observance of such zones would be a delicate task and hence the usefulness of a trajectography tracking

centre. One delegation of the Western Group presented an expert's report on "Keep-Out Zones" as part of a Code of Conduct. "Keep-Out Zones" could play an essential role in a Protection regime which cared for the protection of a State's space activities through agreed and verifiable provisions. The concept of "Keep-Out Zones" in this understanding might be combined with declared or notified pre-launch information, thus contributing essentially to confidence-building measures.

25. A substantial part of the discussions was devoted to confidence-building measures and ensuring greater transparency in space activities. Many delegations were of the view that CBMs was one of the areas where some degree of certainty and convergence of views existed and could form part of a negotiating process with a view to reaching agreements. Several delegations favoured the approach centred on non-interference with non-agressive activities and CBMs which would support that objective.

26. One delegation emphasized that while the CBMs contributed to the positive development in international relations, the discussions on CBMs should not obstruct the creation of a substantive and legally binding treaty banning all space weapons. In its view some of the CBMs already on the table could be considered as verification measures for a future treaty, among them the establishment of an appropriate international supervisory body to inspect objects before they are launched into space.

* * *

27. The discussion of the Friend of the Chair for Terminological Issues centred on two non-papers prepared by him on the phrases "peaceful purposes" and "the militarisation of space". Some delegations of the Western Group thought that basic groundwork on terminology was essential if areas of consensus were to be found. The debate on "peaceful purposes" indicated that some delegations maintained that the concept meant "no military use of space", while other delegations believed it meant "non agressive use of space". One delegation of the Western Group considered that since no delegation questioned the illegality of any aggressive use of outer space, a common denominator existed on that notion. On "militarisation" there was agreement that further work was needed on the definition of a "space weapon". One delegation of the Western Group suggested that it would be useful to concentrate on what was

regarded as being "destabilizing" rather than on trying to define the "acceptable" uses of space.

28. The Friend of the Chair for verification of ASATs held open-ended consultations on the basis of the paper he had prepared (CD/OS/WP.50). In these consultations some delegations insisted that there was no legal instrument that governed activities of States with regard to this system and other delegations of the Western Group recalled that the existing legal regime placed a wide variety of legal restraints on the nature, deployment and use of ASATs. For those delegations the lack of a clear and broad enough definition of antisatellite weapons and their components was a serious obstacle to progress in the preparation of legal instruments. It was suggested that, in spite of their complexities, the problems of definition and verification could be dealt with by the Conference on Disarmament. The question of verification would eventually depend on the type of instrument that was being devised. It was also proposed to explore whether there existed or not, from a strategic or military point of view, any difficulties or any objections ad initio to the preparation of a legal instrument. Some delegations proposed to deal with the subject in a gradual progressive fashion and by confidence-building, transparency and trajectory control measures that would raise the financial and political costs of an aggressive use of Outer Space. One delegation of the Western Group also indicated that ASATs could not be dealt with without having as a legal basis or background an agreement on the concept of aggression. It was the view of the Friend of the Chair that the joint participation of several experts from interested delegations could help to facilitate a better understanding of the problems under consideration and identification of promising areas. One delegation presented a Non-Paper entitled "ASATs: Realities and Prospects".

29. The Friend of the Chair for confidence-building measures in space activities conducted consultations with the interested parties. As the outcome of those consultations, as well as on the basis of the statements and documents previously submitted to the Committee, he drafted an analytical non-paper where he identified five possible areas for the development of CBMs in outer space: a) Strengthening of the 1975 Convention on Registration of Objects Launched into Outer Space: b) Use of satellite monitoring in the interests of the international community; c) Drawing up of "rules of the

road"/a "code of conduct"; d) Inspections of space objects at launching sites; e) Establishment of an international trajectography centre. As a result of further consultations and at the recommendation of several delegations, these areas were grouped under three main headings: a) Measures to promote transparency, openness and predictability; b) Rules for the behaviour of space objects ("Rules of the road"/a "code of conduct" for outer space); c) "Institutional" measures (the establishment of various types of body for the implementation of confidence-building measures: world space organization, international satellite monitoring agency, satellite image processing agency, international space monitoring agency, inspectorate and trajectography centre). The Friend of the Chairman stated that there was wide agreement on the extension of the volume and nature of the information supplied by States on space objects and, perhaps, on a few of the simplest notification measures discussed in the context of "rules of conduct" in outer space. Hence, a study of those topics with the help of technical and scientific experts, would be a promising way of promoting broad consensus.

IV. CONCLUSIONS

30. There continued to be general recognition in the Ad Hoc Committee of the importance and urgency of preventing an arms race in outer space and readiness to contribute to that common objective. The work of the Committee since its establishment in 1985 has contributed to the accomplishment of this task. The debates and the presentations made by experts at this annual session contributed to further identifying and clarifying a number of issues relevant to the prevention of an arms race in outer space. The Committee has also advanced in its efforts to identify areas of convergence suitable for a more structured work. It was recognized once more that the legal régime applicable to outer space by itself did not guarantee the prevention of an arms race in outer space. There was again recognition of the significant role that the legal régime applicable to outer space played in the prevention of an arms race in that environment and of the need to consolidate and reinforce that régime and enhance its effectiveness and of the importance of strict compliance with existing agreements, both bilateral and multilateral. In the course of the deliberations, the common interest of mankind in the exploration and use of outer space for peaceful purposes was acknowledged. In this

context, there was also recognition of the importance of paragraph 80 of the Final Document of the first special session devoted to disarmament, which stated that "in order to prevent an arms race in outer space, further measures should be taken and appropriate international negotiations held in accordance with the spirit of the Treaty on Principles Governing the Activities of States in the Exploration and Use of Outer Space, including the Moon and other Celestial Bodies". The Ad Hoc Committee continued its examination of existing and some new proposals aimed at preventing an arms race in outer space and ensuring that its exploration and use will be carried out exclusively for peaceful purposes in the common interest and for the benefit of all mankind.

31. In the context of their contribution to the discussions on all aspects of the mandate and work programme, the importance of the presentations in the Committee relating to confidence-building measures and to greater transparency and openness in space made in the course of the 1992 session was recognized by the Committee. Although cognizant of the various positions on these matters the Committee also recognized the relevance of that discussion to the work of the Committee.

32. The Committee noted the valuable and significant contribution to the discussions of the experts from several delegations and expressed its appreciation to those delegations that provided those contributions. The Committee equally voiced its appreciation of the preliminary work continued by the Friends of the Chairman and their organization of open-ended consultations on such important issues as those related to ASATs, CBMs and terminological aspects of the prevention of an arms race. It viewed the outcome of their efforts as an encouraging development in the process of building upon the areas of convergence. The Ad Hoc Committee recommended to continue such exercises in 1993.

33. It was agreed that substantive work on this agenda item should continue at the next session of the Conference. It was recommended that the Conference on Disarmament re-establish the Ad Hoc Committee on the Prevention of an Arms Race in Outer Space with an adequate mandate at the beginning of the 1993 session, taking into account all relevant factors, including the work of the Committee since 1985.

CONFERENCE ON DISARMAMENT

CD/1166
1 September 1992

ENGLISH
Original: RUSSIAN

LETTER DATED 11 AUGUST 1992 FROM THE REPRESENTATIVE OF THE RUSSIAN FEDERATION ADDRESSED TO THE PRESIDENT OF THE CONFERENCE ON DISARMAMENT TRANSMITTING DOCUMENTS RELATING TO ARMS CONTROL AND DISARMAMENT AGREED ON DURING THE SUMMIT MEETING BETWEEN THE PRESIDENT OF THE RUSSIAN FEDERATION, B.N. YELTSIN, AND THE PRESIDENT OF THE UNITED STATES OF AMERICA, G. BUSH, IN WASHINGTON IN JUNE 1992*

I have the honour to forward the following documents relating to arms control and disarmament agreed to during the summit meeting between the President of the Russian Federation, B.N. Yeltsin, and the President of the United States of America, G. Bush, in Washington in June 1992:

- A Charter for Russian-American Partnership and Friendship;
- A Framework Agreement;
- A Joint Statement on the Prohibition of Chemical Weapons;
- A Joint Russian-American Statement on the Non-Proliferation of Nuclear Weapons on the Korean Peninsula;
- A Joint Russian-American Statement on a Global Protection System;
- A Joint Russian-American Statement on Cooperation in the Field of Conversion;
- An agreement between the Russian Federation and the United States of America concerning the Safe and Secure Transportation, Storage and Destruction of Weapons and the Prevention of Weapons Proliferation;

---

* The official English texts of the above-mentioned documents are to be found in CD/1162.

GE.92-62907/0800K (E)

- An Agreement between the Ministry of Atomic Energy of the Russian Federation and the Department of Defense of the United States of America concerning the Safe and Secure Transportation and Storage of Nuclear Weapons through the Provision of Emergency Response Equipment and Related Training;

- An Agreement between the Ministry of Atomic Energy of the Russian Federation and the Department of Defense of the United States of America concerning the Safe and Secure Transportation and Storage of Nuclear Weapons through the Provision of Armoured Blankets;

- An Agreement between the Ministry of Atomic Energy of the Russian Federation and the Department of Defense of the United Staes of America concerning the Safe and Secure Transporation and Storage of Nuclear Weapon Material through the Provision of Fissile Material Containers.

Please take the appropriate steps to issue these documents as official documents of the Conference on Disarmament and distribute them to all delegations of member States of the Conference and those of non-member States of the Conference that participate in its work.

I undertand that Ambassador S. Ledogar, the head of the United States delegation at the Conference on Disarmament, has already forwarded the English-langauge version of these documents to the Conference on Disarmament.

(Signed) S. BATSANOV
Ambassador

CONFERENCE ON DISARMAMENT

CD/1167
14 August 1992

Original: ENGLISH

LETTER DATED 12 AUGUST 1992 FROM THE REPRESENTATIVE OF NORWAY ADDDRESSED TO THE SECRETARY-GENERAL OF THE CONFERENCE ON DISARMAMENT TRANSMITTING A REPORT OF THE EXPERT STUDY ON QUESTIONS RELATED TO A COMPREHENSIVE TEST BAN TREATY 1/

I have the honour to enclose herewith the full report of the Expert Study on questions related to a Comprehensive Test Ban Treaty, the final summary chapter of which was circulated as document CD/1151. The study, composed by internationally renowned experts in the field, was commissioned and published by the Norwegian Ministry of Foreign Affairs.

As you will recall State Secretary Helga Hernes introduced the Study in her statement before the CD on 11 June this year.

Yours sincerely

(Signed) Bjørn Skogmo
Ambassador
Chargé d'Affaires a.i.

1/ A limited distribution of this report in English only has been made available to members and non-members invited to participate in the work of the Conference on Disarmament. Additional copies are available from the Permanent Mission of Norway in Geneva.

GE.92-62628/5006H (E)

CONFERENCE ON DISARMAMENT

CD/1168
CD/CW/WP.428
13 August 1992

Original: ENGLISH

LETTER DATED 12 AUGUST 1992 FROM THE REPRESENTATIVE OF THE UNITED KINGDOM OF GREAT BRITAIN AND NORTHERN IRELAND ADDRESSED TO THE SECRETARY-GENERAL OF THE CONFERENCE ON DISARMAMENT TRANSMITTING A PAPER WHICH ADDRESSES THE REQUIREMENTS FOR SAFETY DURING THE ON-SITE INSPECTIONS PROVIDED FOR UNDER THE CHEMICAL WEAPONS CONVENTION

I have the honour to transmit a paper prepared by the United Kingdom, which addresses the requirements for safety during the on-site inspections provided for under the Chemical Weapons Convention.

I believe this topic is of relevance to the future work of the Preparatory Commission for the Organization for the Prohibition of Chemical Weapons and I should be grateful if you would arrange for the paper to be circulated as an official document of the Conference on Disarmament.

(Signed) Sir Michael Weston KCMG, CVO
Ambassador
Leader of the Delegation of the
United Kingdom of Great Britain
and Northern Ireland to the
Conference on Disarmament

GE.92-62636/4795B (E)

UNITED KINGDOM OF GREAT BRITAIN AND NORTHERN IRELAND

The Chemical Weapons Convention: Safety Rules for Inspections

INTRODUCTION

1. Little consideration has been given so far to safety issues during the conduct of inspections to be undertaken under the Chemical Weapons Convention (CWC). But, with the early conclusion of the Convention now expected, it is important that some attention is devoted to this aspect of its implementation.

2. A principal task of the Preparatory Commission will be to carry out the necessary preparations for the effective operation of the Chemical Weapons Convention. The Commission will be tasked in particular to consider recruitment and training of technical personnel, standardization and purchase of equipment and to prepare guidelines for initial inspections. The United Kingdom believes that safety issues must be an essential element in these preparations. Much has been learned about safety issues during the various national practice challenge inspection programmes and during the United Nations Special Commission inspections of chemical weapon production and storage sites. This working paper addresses the safety question by producing an initial assessment of the safety issues derived from United Kingdom involvement in these experiences. It also offers a preliminary set of guidelines (Appendices 1-4) on safety issues for consideration by the Preparatory Commission.

General safety policy

3. One of the first tasks confronting the Technical Secretariat (TS) will be the need to identify minimum safety standards. If local safety standards are higher, the host State should provide either the necessary resources to achieve them or to waive them during the inspection and apply the agreed minimum standards. Thereafter the TS will need continually to assess the safety standards of all States parties and to update its own procedures in line with current good practice.

4. The responsibility for the safety of inspectors lies with the TS and with the Chief Inspector (CI) on site. The CI may be assisted and advised by a Safety Officer (SO) who should be responsible for all aspects of safety and ensuring that guidelines are properly interpreted in the light of prevailing conditions. Safety measures will be strongly site specific and the SO will need to be aware that an obstructive inspected State party might misuse safety restrictions to delay or hinder inspections.

5. In order to satisfactorily address safety issues during inspections the TS might require its own Safety Group (SG). Although this SG would need to be colocated, and work closely with, the TS it is important that it should have the freedom to act independently; it should be able to report directly to the Director-General. In the same way, individual safety officers provided by the SG to accompany large inspection teams must have the authority to report directly to the SG should there be a disagreement over an important

safety matter. (Small teams will probably not justify a full time SO and one of the other specialists will need to be briefed to fulfil this role.) This would apply especially during the planning phase of munition/agent/plant destruction inspections.

6. In practice the SO will assess the various hazards and the risks involved in carrying out the inspection in different ways and produce a balanced judgement on how the work should be done. He will make this judgement in consultation with the CI, and others whilst considering the operational implications. A fault frequently observed is a superb set of instructions laxly implemented. A major task for the SO will be to ensure that the safety rules are enforced.

Safety organization

7. The extent to which inspection teams will require a formal structure, consisting of specialized subgroups, will depend largely on the size of the teams. For large teams, consisting of ten or more inspectors, such a structure will be necessary in order to achieve the highest possible operational efficiency. But whether a formal organizational structure is required or not, safety must be a main principle of all operations.

8. An appropriate organization might be based on the formation of three sub-teams:

(a) a Control Group (CG).

(b) a Safety/Reconnaissance/Contamination Control Group (SRCCG), and

(c) a Reporting Group (RG) to carry out the actual inspection, to record and to collect samples.

This basic organization based upon UNSCOM experience is necessary where extremely hazardous conditions are likely to be encountered. However, at most sites reconnaissance and contamination control will not be required and the SO might report directly to the CG.

9. One of the main tasks of the SO is hazard and risk assessment. Some relevant information can be obtained from the host officials on arrival at the site, but it may vary in quantity and reliability and may possibly be misleading. The wise SO, therefore, will receive any such provided information pertaining to safety but not risk his inspectors until he has carried out a sufficiently detailed reconnaissance to satisfy himself that they will not be put at risk.

Conduct of the inspection

10. Initial inspections and Challenge Inspections at especially hazardous sites should be conducted according to strict guidelines. These might be:

(a) a general reconnaissance of the site by surface vehicle or helicopter to identify the main areas to be inspected and if possible, to identify more or less hazardous areas.

(b) a detailed reconnaissance of the site, or sections of the site, as necessary. This may be extremely dangerous and the SO will have to use whatever appropriate means of protection are available and suggest deploying inspectors in such a way so as to minimize the risk. In some cases the SO may decide that inspectors should not enter at all and that other means of inspection be utilized.

(c) carrying out the reporting part of the inspection. In hazardous situations the risk can be minimized, by limiting the number of inspectors, or eliminated entirely, by relying only on the reports of the reconnaissance team.

In most cases a sufficiently detailed reconnaissance can be done during the initial overview of the site, supported if necessary by a quick look at particular areas by the SO.

General safety

11. Experts intent on pursuing their specialization can be single-minded to the point of endangering personal safety. This can be very important during inspections in unfamiliar surroundings, when even common sense precautions such as personal protection from extreme climatic conditions can be neglected.

12. Inspectors need to recognize that they are responsible for their own safety. They should comply with advice from the SO at all times. At hazardous sites especially, inspectors must remain constantly aware of their personal environment and, in the absence of direct instructions from the SO, apply common sense precautions. Inspectors should also look out for the safety of other team members who may not notice a hazard while engrossed in their own job. An inspector that becomes a casualty through lack of common sense precautions, not only becomes incapable of doing his own job, but becomes a burden on the rest of the team.

13. Suitable clothing, including strong boots, should be worn during inspections together with any specialist protective equipment required. This will vary, depending on both the location and type of inspection site, and also local factors such as climate and the physical condition and nature of the infrastructure. Although a detailed knowledge of conditions at the site is unlikely to be available to inspectors before arrival (except for routine inspections) the general requirements may be predictable. Inspectors should therefore be provided, by the TS, with a recommended equipment list for the different situations likely to be encountered and select their requirements from this list as soon as they know where they are going.

14. Medical matters are very important and it will no doubt be necessary for the TS to have medical experts available to offer advice and, if necessary, to accompany inspection teams into the field. Although it is beyond the scope of the present paper to deal with medical aspects of CWC inspections, some general points for individual inspectors to note are as follows:

(a) obtaining any necessary vaccinations;

(b) obtaining any drugs required to treat endemic diseases;

(c) taking a first aid kit containing any personal medicines and syringes and sterile needles as well as the usual things needed to treat minor injuries and ailments, insect bites, etc.;

(d) as safe food and water supplies cannot be assumed in many areas of the world, inspectors will need to take sensible precautions to ensure that they do not become victims of disease.

Chemical hazards

15. It is important that inspectors with appropriate expertise should be available to cover sites with different types of chemical hazard. The guidelines in Appendix 1 have been produced with this fact in mind and have been divided into two parts to cover CW agent as well as general industrial chemical hazards.

16. Different individual protective ensembles (IPE) require different donning and removal procedures. Thought will need to be given to the TS using a standard system of IPE to allow for the proper training of inspectors in its use (but see para. 2.1).

17. Meteorology and downwind vapour hazard prediction form an essential part of safety planning at chemically hazardous sites. Basic wind speed and direction measuring equipment is crucial, together with some form of vapour hazard prediction model. This can be as simple as a set of tables but excellent computer (PC) based programmes are now available that perform all the necessary calculations and present the results in a clear pictorial format.

18. For work in hot weather conditions and tropical climates measurement of the web bulb globe temperature index will be required to enable safe working times in IPE to be calculated. This is crucial if impermeable clothing has to be worn. This measurement can easily be made using inexpensive and portable miniature equipment incorporating electronic computation and direct readout of the required index values.

Structural hazards

19. Some of the more important points to emerge from recent experience are included in Appendix 2 in the form of guidelines for inspectors. Many of these points deal specifically with bomb damaged structures but others are appropriate to general safety on any industrial site, particularly in areas where the maintenance and repair of broken or damaged structures and the removal of hazardous waste may be neglected. For convenience, hazards in bomb damaged structures have been listed separately from more general hazards.

Explosive ordnance hazards

20. It is most unlikely that CWC inspectors involved in Challenge Inspections will encounter unexploded ordnance but it is a possibility, and suitable guidelines are given in Appendix 3. It is much more likely that inspectors will come into contact with live munitions of various natures in storage or

explosives handling facilities. These types of facilities should have their own safety rules but these vary between nations and in any case are open to local interpretation.

21. It is likely that the TS will need to produce a set of agreed guidelines for use in explosives establishments. This will need to cover aspects such as protective clothing and equipment, especially electrical equipment. Since all electrical equipment (including cameras, torches and recorders) need to be certified as safe for use in the various categories of explosives hazard, the TS will need to arrange for certification acceptable to all States Parties.

Radiation hazards

22. Hazards from sources of both ionizing and non-ionizing radiation are unlikely to be encountered by inspectors except during inspections of nuclear sites. However, inspectors should be aware of this possibility and remain alert for sources of radiation.

23. Sources such as 60^{Co} are used routinely in medical equipment and in industrial X-ray and gamma ray imaging systems. Inspectors should be familiar with the appearance of this type of equipment and should be aware that it is often used by the military to examine munitions. Consequently, X-ray equipment could be encountered during challenge inspections of ammunition storage and handling facilities.

24. To avoid unexpected exposure to ionizing radiation thought needs to be given to a small portable Geiger counter being a part of standard equipment. Hazards from non-ionizing radiation are likely to be even less of a problem to inspectors but they should be aware of the potential for harm and take care with lasers and microwave sources, including radars.

Packaging and transport of CW-related substances

25. The safe packaging and transport of samples of CW-related substances can cause severe problems. These problems are usually more conceptual than real and safe packaging is quite straightforward. The main problem is perceived to lie with volatile toxic substances that, if not suitably contained, could create a vapour hazard. Non-volatile substances, such as toxins and even pathogens, pose much less of a risk and agreed packaging and transport regulations already exist.

26. The principle on which suitable packaging for volatile toxic substances could be based is to use multiple layers (say three) of containment with a series of robust containers packed in activated charcoal. A vast excess of charcoal would be used so that in the extremely unlikely event of total failure of the primary containers there will be sufficient capacity in the first layer alone to irreversibly absorb all the contents many times over. Furthermore, the outer container would be made of stainless steel with a sealed lid capable of resisting any conceivable impact or pressure change and any fire without distortion, at least until such time as the contents have been destroyed by the heat.

27. Appendix 4 contains details of the requirements for packaging that are currently being discussed in the United Kingdom between the Civil Aviation Authority and the Chemical and Biological Defence Establishment. It seems likely to be accepted as suitable.

Conclusion

28. Given the wide variety of sites that are likely to be encountered by the CWC inspectorate, many of which will be intrinsically hazardous, it will be important that the Technical Secretariat fully considers the safety aspects of inspections. While it would be undesirable to insist on enforcement of rigid rules irrespective of the conditions on site under investigation, a casual attitude to personal and collective safety is equally undesirable. The TS will therefore need to feature safety as a major part of its training programme and to ensure that safety is central to inspections. Safety aspects will depend on the nature of the site under investigation, but inspectors must possess a grounding in basic minimum procedures. It is hoped that the guidelines in this paper and its accompanying annexes will provide a useful starting-point for the Preparatory Commission's own work on inspector safety.

Appendix 1

CHEMICAL SAFETY GUIDANCE FOR CHEMICAL HAZARD AREAS: THESE MEASURES MAY APPLY DURING DESTRUCTION OF PRODUCTION FACILITIES, BULK AGENT AND MUNITIONS

1. General policy

- On matters of safety the advice of the SO should always be followed unless specifically overruled by the CI.

- No potentially chemically hazardous area will be entered by inspectors until a proper reconnaissance has been carried out by the SO.

- No hazardous work will be carried out in the absence of the proper authority (SO or CI) and supervision.

- A minimum of three persons should work together at any time to ensure that any casualty can be evacuated safely.

2. Guidance for inspecting industrial chemical plants

- In the United Kingdom, the Health and Safety Executive's Factory Inspectorate is charged with monitoring and enforcing health and safety legislation at United Kingdom chemical plants. Similar regulatory bodies operate in other OECD countries. Whilst there is no "safety manual" for United Kingdom HSE inspectors as such, which could be used to assist the TS in compiling composite guidelines for its inspectors, individual inspector's approaches to personal safety during factory visits are shaped by the same basic precautions identified in Appendix 2, paragraphs 2 to 8. The Preparatory Commission might none the less invite States Parties to submit any relevant information or any appropriate documentation derived from their own experiences.

3. Guidance for inspecting CW agent contaminated areas

- The respirator, gloves, personal decontamination kit and (if nerve agents are expected) atropine autoinjectors should be carried at all times. Higher levels of protection will be determined by the SO as appropriate.

- Respirators should be checked before entering a possible vapour hazard area.

Appendix 2

STRUCTURAL SAFETY GUIDANCE FOR USE IN UNSOUND BUILDINGS

GENERAL GUIDANCE FOR INSPECTING INDUSTRIAL SITES

1. DO NOT venture into any areas or buildings that have not been cleared by the SO. Never enter a structure alone. IF IN DOUBT, STAY OUT.

Before entering a structure

2. Always wear a hard hat, even if a respirator is being worn.

3. Use adequate lighting. Wait after entering a darkened building from bright sunlight until your eyes become accustomed to the gloom.

4. Keep one hand free and wear gloves, especially in a chemical plant.

5. Walk slowly and keep a lookout in all directions. Remember that vision is restricted when wearing a respirator. Wear safety glasses if available and appropriate.

6. Beware of loose or lightly fixed fittings, cladding sheets, brickwork or structural members such as roof or wall purlins. Do not trust your weight to fixtures, including guard rails, unless sure that they are firmly fixed. Be especially careful in high winds.

7. Beware of areas or buildings that have been damaged by fire; they may fail suddenly. In particular, be wary of concrete that has changed to a pink, white or buff colour which indicates an area of major structural weakness that may not otherwise be apparent; keep clear and inform the safety officer.

8. Watch your footing and wear good solid leather boots. In particular watch out for:

- jagged ends of metal protruding from concrete;
- loose structural elements that may move or fly up when stepped on;
- upward pointing nails in loose boards from packing cases;
- electrical cables, they may be live;
- pipes, especially in a chemical works;
- sloping surfaces;
- slippery and/or wet floors, the "wet" may not be water.

RULES FOR INSPECTING BOMB DAMAGED STRUCTURES

9. Do not congregate in damaged buildings, particularly on floors above ground.

10. Watch out for concrete slab and beam deflections of more than 12° and brickwork that has been displaced sideways by more than half the thickness of the masonry. Structures with these features are extremely unsafe. DO NOT go under them for any reason at all.

11. Buildings that have stood for several months after blast damage may still collapse with little or no warning. A slight gust of wind or the vibration of heavy machinery may be all that is needed to cause collapse. If areas creak or make other noises STAY CLEAR.

Appendix 3

GUIDANCE FOR AREAS WHERE THEY MAY BE UNEXPLODED ORDNANCE

These rules are for general guidance and are not a substitute for rules at ammunition storage or handling facilities. The TS will need to produce a set of such rules agreed by all States party to the CWC.

1. Never enter an area that may contain unexploded ordnance (UXO) without the express permission of the SO.

2. Use of any electrical device (CAM, camera, videocamera etc.) must be approved in advance by the SO or Explosives Ordnance Personnel (EOD). DO NOT carry spare batteries. Battery compartments of electrical devices should be taped to prevent inadvertent removal of batteries in an explosive hazard area. In a chemical plant or storage area the hazard of explosive atmospheres needs to be considered.

3. Watch your step. Walk on hard, cleared surfaces or in areas that you know have been cleared by EOD.

4. Don't touch anything. A UXO may not necessarily look like a munition.

5. Report any suspect UXO, mines, booby traps etc. IMMEDIATELY to the SO or EOD. Keep clear!

6. Report any leakage or vapour emission from a UXO IMMEDIATELY to the SO or EOD (this also applies to munitions in a storage or handling facility). Put on personal respirator and leave the area at once moving upwind but without running. Warn all personnel in the vicinity.

Appendix 4

CONTAINERS FOR TRANSPORTING SAMPLES

1. Primary container:

This will be the container in immediate contact with the sample. The samples will be of three types:

(i) Vapour samples. This container consists of a mild steel tube of approximate dimensions 6 mm (diameter) x 95 mm fitted with airtight end caps. In the tube is rigidly packed 50 mg of an inert absorbent material such as Tenax or Poropak Q. The vapour sample is absorbed on to the absorbent material, and usually requires heating to above 200°C to displace it. The quantity of toxic material in this primary container is of the order of 100 picograms (0.0000001 g);

(ii) Environmental samples. This could be a sample of ditchwater, soil, vegetation, blood, urine or material that is thought to have been contaminated by a toxic substance. These samples will be contained in a 10 ml glass vial that has a "crimp" fitted teflon cap which requires a special tool to remove it. There is no danger of the cap being shaken loose in transit. Typically, up to 10 mg (0.01 g) of toxic compound would be expected in this type of sample;

(iii) Bulk samples. This is the "worst case" sample. A bulk substance sample would be contained in a 2 ml vial sealed with a similar (though smaller) cap to that described above for environmental samples. A sample size of 100 mg (0.1 g) is anticipated for this sample type.

These three sample containments serve as primary containment. They will be labelled as follows:

(a) Sample number

(b) A statement that the contents are "Very toxic".

2. Secondary container:

The secondary container will consist of an aluminium can of dimensions 40 mm (diameter) x 125 mm. The lid will be screw cap fitted with a rubber seal.

Two primary containers will be packed into a secondary container. The primary containers will first be individually packed in a small polythene bag, then in "bubble material" to prevent mechanical damage, and finally, into a secondary container. The void in the secondary container would be filled with the absorbent material AST charcoal. This would render the package safe in the very unlikely event of leakage or seepage from a primary container. Approximately 25 g of charcoal will be used which is sufficient to absorb 2.5 g of material. Hence as the worst possible case only results

in 0.2 g of leaking material (resulting from total destruction of two type (iii) primary containers) there is more than a tenfold excess of absorbent material in the secondary container.

After inclusion of the two primary containers and the adsorbent material, the lid will be tightly fitted and sealed with a suitable thread sealant such as "Loctite". The precise contents of the samples will be unknown (the purpose of the exercise) is to analyse them! - but a worst case would be the compound Sarin, which would pose the greatest risk when volatility is taken into consideration as well as toxicity. Based on this premise, the secondary container would be labelled as in figure 1.

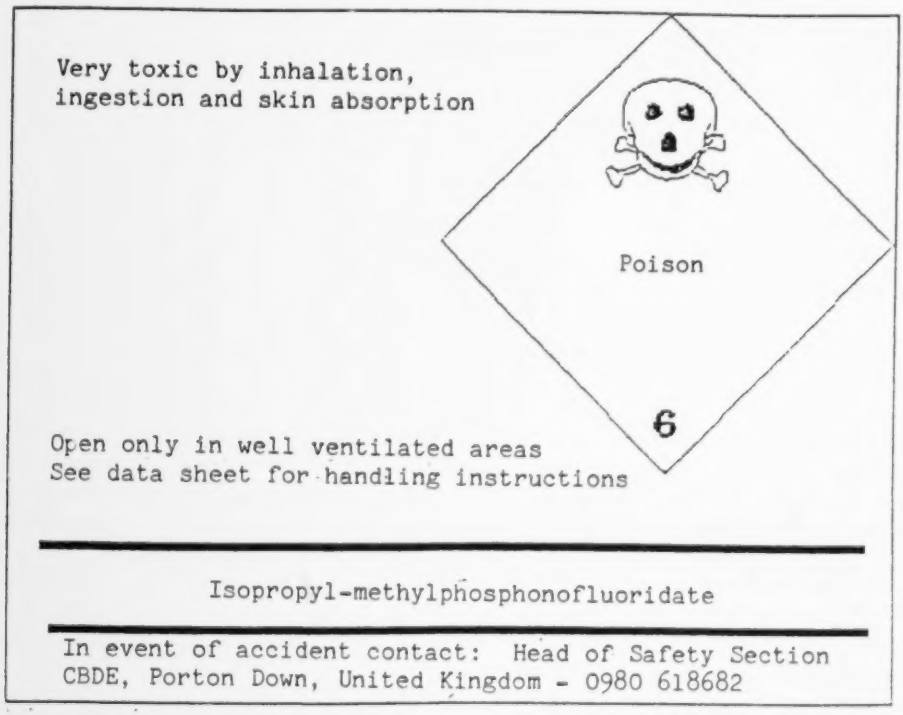
Very toxic by inhalation,
ingestion and skin absorption
Poison
6
Open only in well ventilated areas
See data sheet for handling instructions
Isopropyl-methylphosphonofluoridate
In event of accident contact: Head of Safety Section
CBDE, Porton Down, United Kingdom - 0980 618682

Figure 1

3. Tertiary container:

The proposed tertiary container is one that has been conceived at CBDE and should provide both sufficient protection against mechanical damage, sudden depressurization and fire. The container is a stainless steel bomb of dimensions 160 mm diameter (OD) and 160 mm height. The container will be 10 mm wall thickness and be sealed by a flanged 10 mm lid fitted with a viton "O" ring and secured with six 12 mm diameter bolts. The steel will be to BS 970 325531. A schematic of this container is shown below in figure 2.

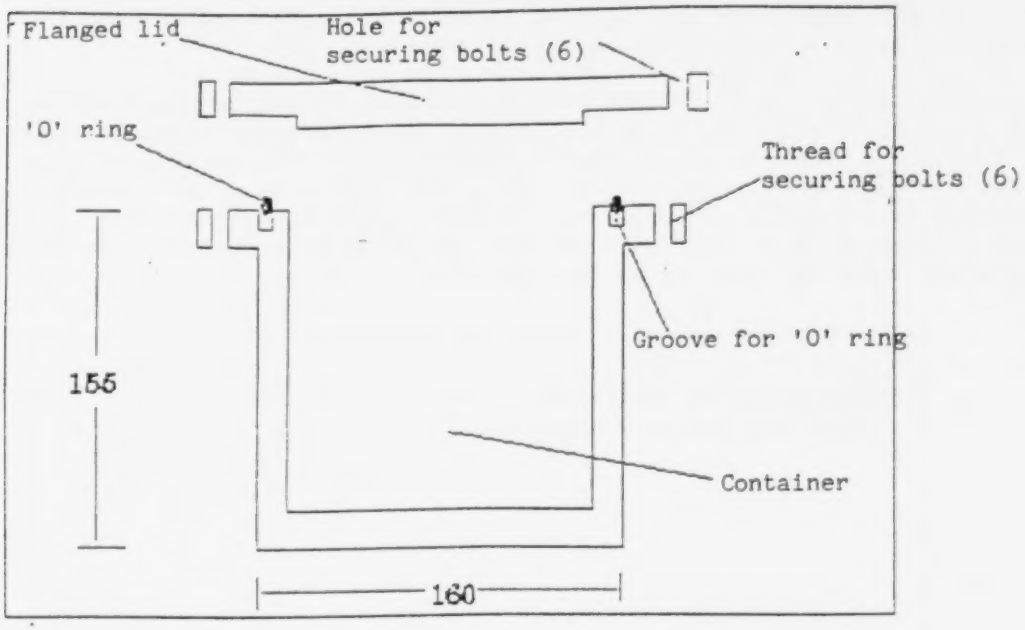

Figure 2: Schematic of tertiary container

The secondary container would then itself be contained in a tertiary container in the following manner. Four secondary containers would be contained in each tertiary container. The void around the secondary containers in this third container would be filled with about 100 g of charcoal. The tertiary container would constitute the container which would provide the samples with a high degree of mechanical and fire protection.

The tertiary container will be labelled as in figure 1 above and will also display two additional labels, viz:

(a) Handling label for package orientation

(b) Handling label Cargo Aircraft Only.

4. Transit case (containment 4):

The final containment would be primarily for ease of handling and is thus essentially a transit case. The transit case will hold two of the tertiary containers. The transit case will be made of aluminium sheet of approximately 4 mm thickness. The case will be of dimensions 430 mm x 250 mm x 200 mm, will hold two tertiary containers securely in an internal frame and will have a lid that is airtight and be lockable and sealable. Two handles will be attached to the outside to aid in carrying the case.

The case will carry the label shown in figure 3 below. In addition it will also display:

(a) Handling label for Cargo Aircraft Only

(b) Advice to Customs that they may seal the case and be present when it is opened at CBDE if they so wish it.

(c) Safety data sheets will be attached to this container.

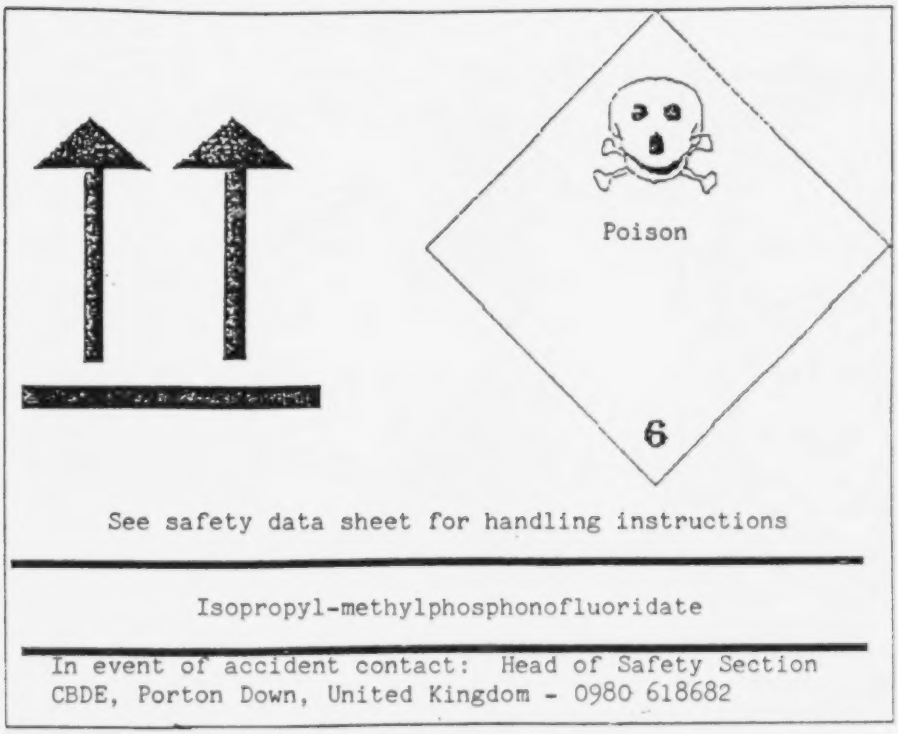
Poison
6
See safety data sheet for handling instructions
Isopropyl-methylphosphonofluoridate
In event of accident contact: Head of Safety Section
CBDE, Porton Down, United Kingdom - 0980 618682

Figure 3: Label for transit case

5. Summary of packaging:

Based on a worst case scenario where bulk agent would be transported, each transit case would contain:

1. Sixteen primary samples of 0.1 g each - total weight 1.6 g.

2. These would be packed in eight secondary containers containing a total of 200 g of charcoal.

3. In turn, the secondary containers would be packed into two tertiary containers together with about 100 g of charcoal in each.

4. Two of these containers would be in each transit case.

5. The net weight of the transit case would be about 35 kg, of which 1.6 g would be sample and 400 g absorbent. Four hundred grams of charcoal is sufficient to safely absorb about 40 g of sample. Thus there is a 25-fold excess of absorbent present even in the worst case.

The contents of the transit case are also summarized below in figure 4.

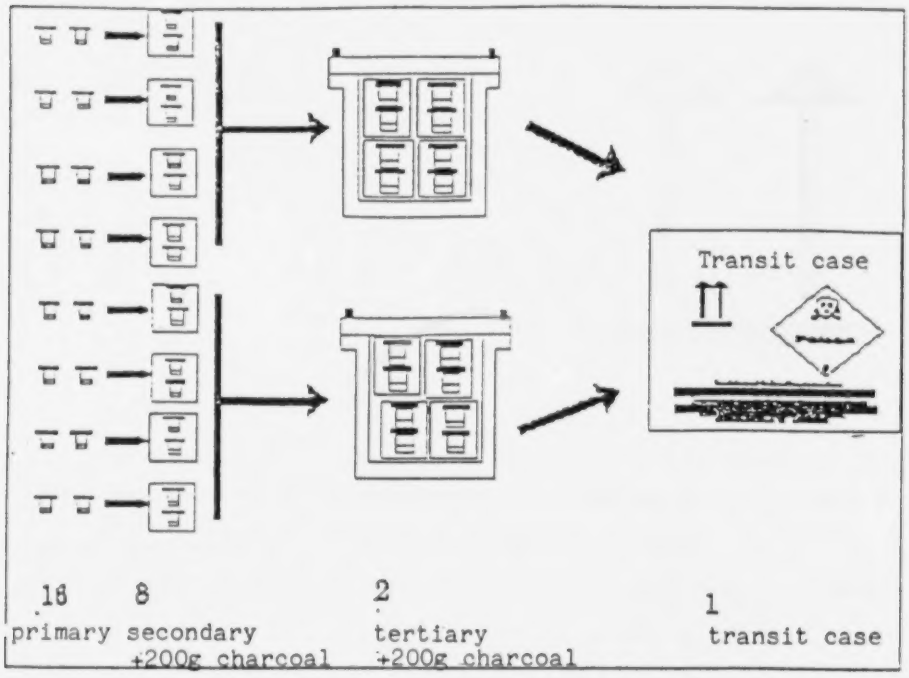

Figure 4: Summary of proposed packaging

- - - - - -

CONFERENCE ON DISARMAMENT

CD/1169
CD/CW/WP.437
24 August 1992

Original: ENGLISH

LETTER DATED 24 AUGUST 1992 FROM THE REPRESENTATIVE OF NORWAY ADDRESSED TO THE SECRETARY-GENERAL OF THE CONFERENCE ON DISARMAMENT, TRANSMITTING A REPORT ENTITLED "TRANSPORT OF SAMPLES CONTAINING CHEMICAL WARFARE AGENTS BY AIR"

I would appreciate your kind cooperation in having the enclosed report, entitled "Transport of samples containing chemical warfare agents by air" circulated as both a document of the Conference on Disarmament and a Working Paper of the Ad Hoc Committee on Chemical Weapons.

This research report is a contribution by Norway in a series that was started in 1982 on sampling and the handling of samples related to a Chemical Weapons Convention.

(Signed) Jostein H. Bernhardsen
Minister Counsellor
Permanent Mission of Norway

GE.92-62741

TRANSPORT OF SAMPLES CONTAINING CHEMICAL WARFARE AGENTS BY AIR

Introduction

In connection with verification of a Chemical Weapons Convention, it is important to have methods for safe and rapid transport to the Technical Secretariat and/or designated laboratories of samples collected during an inspection. Since many of the schedule 1 compounds are unstable, the transport time should be kept at a minimum, thus arguing for transport by air. Problems with getting permission to transport samples containing chemical warfare agents by commercial airline companies have, however, been addressed on several occasions during the International Comparison (Round-Robin) Tests (CD/CW/WP.350 July 1991 and CD/1155 June 1992). The Norwegian Defence Research Establishment has therefore examined the International Civil Aviation Organization (ICAO) / International Air Transport Association (IATA) regulations for transport of dangerous goods by air. A method for packing, labelling and transport of samples containing relatively low concentrations of chemical warfare agents has been worked out. This method has been tested by transport of samples containing chemical warfare agent simulants and has been accepted by airline companies.

Classification of chemical warfare agents

Chemical warfare agents should be classified as dangerous goods, class 6, division 1, i.e. poisonous (toxic) substances. Since none of the schedule 1 compounds are mentioned by name in the regulations, the generic shipping names: poisonous liquids n.o.s. (not otherwise specified) or poisonous solids n.o.s. should be used. These groups have UN numbers 2810 and 2811 respectively. The packing instructions for such samples depend on the amounts and toxicity of the poisonous compound contained in it. The packing group could be determined by using Table 1 or 2.

Packing Group	Oral toxicity LD_{50} (mg/kg)	Dermal toxicity LD_{50} (mg/kg)
I	≤5	≤40
II	>5 ≤50	>40 ≤200
III	(s) >50 ≤200 (l) >50 ≤500	>200 ≤1000

Table 1 Criteria for routes of administration other than inhalation

(s): solids (l): liquids

Packing Group	Inhalation toxicity by dust and mist LC_{50} (mg/l)	Inhalation toxicity by vapours
I	≤0.5	$V \geq 10 * LC_{50}$ and LC_{50} ≤1000 ml/m³
II	>0.5 ≤2	$V \geq LC_{50}$ and $LC_{50} \leq$ 3000 ml/m³
III	>2 ≤10	$V \geq 0.2 * LC_{50}$ and LC_{50} ≤5000 ml/m³

Table 2 Criteria for inhalation of vapours, dust and mist

V: Vapour concentration in air (ml/m³) at 20°C and standard atmospheric pressure

In most cases, the composition and toxicity of the samples are not known prior to transport. The samples should then be placed in the most restrictive group (i.e. Packing Group I). Some special provisions should, however, be followed by transporting poisonous solids or liquids:

Liquids having a vapour inhalation toxicity of Packing Group I are forbidden on both passenger and cargo aircraft. Liquids having a mist inhalation toxicity of Packing Group I are forbidden on passenger aircraft. They may be carried on cargo aircraft providing they are packed in accordance with the packing instruction for the Packing Group I substance and the maximum net quantity per package does not exceed 5 l.

Solids having an inhalation toxicity of Packing Group I are forbidden on passenger aircraft. They may be carried on cargo aircraft providing they are packed in accordance with the packing instruction for the Packing Group I substance and the maximum net quantity per package does not exceed 15 kg.

These special provisions would normally not cause problems, since the vapour or mist concentrations of small amounts of schedule 1 compounds diluted in a sample matrix are very low.

Packing and labelling

The general packing requirements given in the regulations (e.g. the need for absorbing material surrounding the inner packagings) should be followed when transporting all sorts of dangerous goods. In addition, the packing instructions given in Table 3 below should be used for chemical warfare agents. These packing instructions are shown in detail in Annex 1 to this paper.

	Passenger aircraft		Cargo aircraft	
	Packing instruction	Max net quant. pr pk.	Packing instruction	Max. net quant. pr pk.
Poisonous solids n.o.s.	606	5 kg	607	50 kg
Poisonous liquids n.o.s.	603	1 l	604	30 l

Table 3 Packing instructions for chemical warfare agents

A Shipper's Declaration for Dangerous Goods should be completed as shown in annex 2.

The outer packagings should be type approved for transport of dangerous goods (i.e. have proper UN-marking) and labelled with the following informations:

1. Class no., Shipping name, Technical name and UN-number

e.g. Class 6.1
Poisonous liquids n.o.s
Water samples containing chemical warfare agents
UN 2810

2. Shipper's name and address

3. Class hazard label: Black skull and crossbones on white background. Class and division numbers (i.e. 6.1) should be written in the lower corner of the label.

4. Package orientation (two arrows indicating the top of the package)

5. UN -marking

e.g.

(U N) 4D/X60-Y75-Z100
S/91/S/SP-326

where 4D is the type of outer packaging (plywood box),
X60-Y75-Z100 is the maximum relative density of liquids or the maximum weight of solids the type has been tested for in Packing groups I, II and III respectively,
S means that the type is intended to contain solids or inner packagings,
91 is the two last digits of the production year of the packaging,
S is the State authorizing the allocation of the mark (Sweden) and
SP-326 is the name of the manufacturer or other identification of the packaging specified by the appropriate national authority.

Transport exercise

The packing and labelling procedures have been tested by trial transports of packages containing some environmental samples (water, soil, sand and pieces of rubber and protective clothing) containing the harmless chemical warfare agent simulant dipropyleneglycol monomethylether (DPM). The shipping names "poisonous solids n.o.s." and "poisonous liquids n.o.s" and the technical names "environmental samples containing chemical warfare agents" and "water containing chemical warfare agents" were used (see annex 2). The packages have been sent from Oslo to North Norway, to Prins Maurits Laboratory TNO in The Netherlands and to Civil Defence Analytical Chemical Laboratory in Denmark and back. Different cargo handling and airline companies and both passenger and cargo aircrafts have been used for the transport.

The samples were placed in 50 ml glass bottles with air-tight screw caps and the bottles packed in polyurethane foam with activated charcoal. The samples were then placed in a plywood box (40 cm x 30 cm x 27 cm) surrounded by foam rubber. The maximum net quantities per inner packages (glass bottles) given in annex 1 and outer package (plywood box) given above were observed. The plywood box was labelled according to the regulations described above.

Conclusions

The procedures for packing and labelling of samples containing traces of chemical warfare agents have been accepted by all but one airline company. This company did not accept the technical name: "environmental samples containing chemical warfare agents", but accepted the more specific name: "2,2-dichlorodiethylsulfide in sand and rubber". If, therefore, on-site analysis of the samples gives indications of a schedule 1 compound present, this could be included in the technical name.

One general observation is that the airline companies have the responsibility for safety on board, and therefore make the final decision on taking the samples with them or not, even if the packing and labelling are in accordance with the regulations. It is also important

that the outer packagings are type approved for transport of dangerous goods in packing group I.

Even if the transport exercise showed some minor problems, the procedures for packing and labelling described here have been used successfully for transport of samples containing traces of chemical warfare agent simulants. To gain more experience, more trial transports should, however, be carried out. The procedures are unsuitable for the transport of concentrated samples of schedule 1 compounds from production, destruction or storage facilities. The problem encountered with transportation of such samples has to be dealt with by changing the ICAO/IATA regulations. Such changes should also take into account the need for exchange of analytical reference substances between the Technical Secretariat and designated laboratories.

ANNEX 1: PACKING INSTRUCTIONS

Packing instruction 603

Single packagings are not permitted.

Combination packagings:		Code	Max. quantity for inner package
Inner package:	* Glass or earthenware	- IP.1	0.5 l
	* Plastic	- IP.2	0.5 l
	* Metal	- IP.3, IP.3A	1.0 l
	* Glass ampoule	- IP.8	0.5 l
Outer package:	* Steel drum	- 1A2	
	* Aluminium drum	- 1B2	
	* Steel jerrican	- 3A2	
	* Plywood drum	- 1D	
	* Fibre drum	- 1G	
	* Plastic drum	- 1H2	
	* Plastic jerrican	- 3H2	
	* Wooden box	- 4C1, 4C2	
	* Plywood box	- 4D	
	* Reconstituted wood box	- 4F	
	* Fibreboard box	- 4G	

Packing instruction 604

		Code
Single packagings:	* Steel drum	- 1A1
	* Aluminium drum	- 1B1
	* Steel jerrican	- 3A1
	* Composites (plastic)	- all
	* Cylinders	- p. 3-8-2 (1)

Combination packagings:		Code	Max. quantity for inner package
Inner package:	* Glass or earthenware	- IP.1	1.0 l
	* Plastic	- IP.2	1.0 l
	* Metal	- IP.3, IP.3A	2.5 l
	* Glass ampoule	- IP.8	0.5 l

		Code
Outer package:	* Steel drum	- 1A2
	* Aluminium drum	- 1B2
	* Steel jerrican	- 3A2
	* Plywood drum	- 1D
	* Fibre drum	- 1G
	* Plastic drum	- 1H2
	* Plastic jerrican	- 3H2
	* Wooden box	- 4C1, 4C2
	* Plywood box	- 4D
	* Reconstituted wood box	- 4F
	* Fibreboard box	- 4G

Packing instruction 606

Single packagings are not permitted.

Combination packagings:		Code	Max. quantity for inner package
Inner package:	* Glass or earthenware	- IP.1	0.5 kg
	* Plastic	- IP.2	1.0 kg
	* Metal	- IP.3, IP.3A	1.0 kg
	* Plastic bag	- IP.5	0.5 kg
	* Fibre	- IP.6	0.5 kg
	* Glass ampoule	- IP.8	0.5 kg
	* Paper, plastic/Aluminum	- IP.10	0.5 kg
Outer package:	* Steel drum	- 1A2	
	* Aluminium drum	- 1B2	
	* Steel jerrican	- 3A2	
	* Plywood drum	- 1D	
	* Fibre drum	- 1G	
	* Plastic drum	- 1H2	
	* Plastic jerrican	- 3H2	
	* Wooden box	- 4C1, 4C2	
	* Plywood box	- 4D	
	* Reconstituted wood box	- 4F	
	* Fibreboard box	- 4G	

Packing instruction 607

		Code	
Single packagings:	* Steel drum	- 1A1, 1A2	
	* Aluminium drum	- 1B1, 1B2	
	* Steel jerrican	- 3A1, 3A2	
	* Plywood drum	- 1D, with inner plastic liner	
	* Fibre drum	- 1G, with inner plastic liner	
	* Plastic drum	- 1H1, 1H2	
	* Plastic jerrican	- 3H1, 3H2	
	* Composites (plastic)	- all	
Combination packagings:		Code	Max. quantity for inner package
Inner package:	* Glass or earthenware	- IP.1	1.0 kg
	* Plastic	- IP.2	2.5 kg
	* Metal	- IP.3, IP.3A	2.5 kg
	* Plastic bag	- IP.5	1.0 kg
	* Fibre	- IP.6	1.0 kg
	* Glass ampoule	- IP.8	0.5 kg
	* Paper, Plastic/Aluminum	- IP.10	1.0 kg
Outer package:	* Steel drum	- 1A2	
	* Aluminium drum	- 1B2	
	* Steel jerrican	- 3A2	
	* Plywood drum	- 1D	
	* Fibre drum	- 1G	
	* Plastic drum	- 1H2	
	* Plastic jerrican	- 3H2	
	* Wooden box	- 4C1, 4C2	
	* Plywood box	- 4D	
	* Reconstituted wood box	- 4F	
	* Fibreboard box	- 4G	

The codes used in the packing instructions, are codes for designation of types of packagings.

ANNEX 2: SHIPPER'S DECLARATION

Shipper

NORWEGIAN DEFENCE RESEARCH
Establishment
P.O. Box 25,

N-2007 KJELLER, NORWAY

Air Waybill No.

Page of Pages

Shipper's Reference Number

Consignee

ANDØYA AIRPORT
Andenes

Norway

Two completed and signed copies of this Declaration must be handed to the operator

TRANSPORT DETAILS

This shipment is within the limitations prescribed for (delete non-applicable)

PASSENGER AND CARGO AIRCRAFT

~~CARGO AIRCRAFT ONLY~~

Airport of Departure: Oslo, Fornebu

Airport of Destination: ANDENES

WARNING

Failure to comply in all respects with the applicable Dangerous Goods Regulations may be in breach of the applicable law, subject to legal penalties. This Declaration must not, in any circumstances, be completed and/or signed by a consolidator, a forwarder or an IATA cargo agent.

Shipment type (delete non-applicable)

NON-RADIOACTIVE ~~RADIOACTIVE~~

NATURE AND QUANTITY OF DANGEROUS GOODS (see sub-Section 8.1 of IATA Dangerous Goods Regulations)

Dangerous Goods Identification				Quantity and type of packing	Packing Inst.	Authorization
Proper Shipping Name	Class or Division	UN or ID No	Subsidiary risk			
Poisonous solids n.o.s. (Environmental samples containing chemical warfare agents)	6.1	UN2811		1 Plywood box x 2 kg	606 I	
Poisonous liquids n.o.s. (Water containg chemical warfare agents)	6.1	UN2810		1 Plywood box x 1 l	603 I	

Additional Handling Information

I hereby declare that the contents of this consignment are fully and accurately described above by proper shipping name and are classified, packed, marked and labelled, and are in all respects in the proper condition for transport by air according to the applicable International and National Government Regulations.

Name/Title of Signatory

Place and Date

Signature (see warning above)